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Quick Strategic Force Closure Estimates for Roughly Defined Force Requirements

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ABSTRACT

Emerging defense strategy postulates early, fast, and relatively large-scale deployment of U.S. forces to multiple locations with overlapping timelines. Recently, the U.S. Transportation Command developed a Strategic Mobility Quick-Look tool as a surrogate for more detailed and time-consuming mobility simulation models which were deemed inappropriate for a senior leadership war gaming exercise. To estimate force closure over time and highlight potential mobility issues, the tool requires a description of deploying combat forces and available strategic mobility lift assets (air and sea). Using rough force closure estimates, the tool enabled senior leaders to quickly evaluate both the feasibility and risk associated with various force employment strategies, allowing the impact of mobility to be addressed throughout the exercise. Because the tool is general and flexible in it's ability to represent new scenarios, analysts have used it on many occasions to identify the "big issues" before running more detailed simulation models. The purpose of this presentation is to share a "Quick-Look" approach to examining air/sea force closure using best available data and planning factors.

INTRODUCTION

With increased emphasis in evaluating national response capability to smaller scale regional contingencies, leaders and decision makers require new tools to support the development of programs and policies to address this new challenge. To provide decision support to U.S. Transportation Command leadership during seminar wargames, in-house analysts developed a Strategic Mobility Quick-Look tool that could provide insight into the allocation of finite mobility assets. Seminar wargames are generally focused on evaluating concepts of operation at the operational level of war. As such, the tool is designed to provide a rapid assessment of transportation feasibility of multiple scenarios in which the force to be deployed is defined in very general terms. To maximize usefulness in the seminar wargaming environment, all the major variables impacting the strategic mobility problem are incorporated into a Microsoft Excel user-friendly "*what-if*" interface. The results are distilled into a single snapshot which includes a closure graphic and information and/or warning messages as appropriate.

DECOMPOSING THE PROBLEM

At its basic level, the transportation feasibility question is one of time and distance--how long does it take to move a given amount of cargo to a specific place? Although this may seem a straightforward question, there are a multitude of other questions that impact answering this apparently simple question. To fully support decision makers, it is necessary to address as many of the underlying questions as feasible. These include the composition of the cargo to be moved, the composition of the airlift and sealift assets available to support the movement, and the infrastructure at the origins, destinations and en route locations.

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DEFINING THE MOVEMENT REQUIREMENT

At the seminar level of wargaming, the usual level for dealing with force definition is at the major employable unit level – usually brigade and fighter wing equivalents. For our purposes standard units were provided as default data along with two user-defined units, if required. While default data is provided to simplify the force requirement definition process, the name, type, and definition of the standard unit can be changed as necessary by the user. For ground forces, heavy, light, and transformation brigades were included. For air forces, fighter squadron and bomber element basic units were included. Marine units are represented by Marine Expeditionary Brigade and Marine Expeditionary Force building blocks. Naval units are not included as most naval combat capability self deploys.

Planning weights for each of the building blocks are provided and editable. This weight is intended to represent the employment unit and any other assets that are habitually associated with that unit. In addition to the employment units, there is a "tooth to tail" ratio of accompanying support units and force structure that must also be transported to the theater of operations. These units, usually referred to as "below the line," include theater infrastructure and units at echelons above division. Since the "tooth to tail" ratio of accompanying forces is highly situational dependent, this input is intended to be user provided as a ratio for each of the base employment units. Combat support and combat service support (CS/CSS) units associated with a unit can either be represented as an additive ratio such as there are 2 tons of CS/CSS for every 1 unit ton or by using a ratio of zero and increasing the weight of the unit appropriately.

Finally, the deployed force must be sustained. This requirement is represented as a ratio of sustainment tonnage to total deployed tons. As with the accompanying support unit requirement, sustainment is represented as a ratio of total unit deployment tonnage. This parameter is very sensitive to the scenario and the concept of operations and, therefore, must be carefully considered for the assessment at hand.

Combining all these tonnages together provides a rough definition of the total movement requirement. No attempt is made in this process to assign specific deployment requirements to specific modes of transportation. It is assumed that the commander in charge of the deployment will insure that the appropriate transportation mode selection decisions and prioritization are made at execution.

Scenario: To: Region 2

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	5	2					1			8
Lt Bde	3	3								6
PATRIOT	1	2								3
Fighter Sqdn	4	4		2						10
BE										0
MEB										0
MEF	1	1		1						3
IBCT										0
other 2										0
other 3										0

Reference Data			Requirement Summary	
Type Unit	Combat "+" STONS	Ratio: CS/CSS to Combat "+"	Combat "+"	CS/CSS
Hvy Bde	35,000	2.00	280,000	560,000
Lt Bde	7,900	2.00	47,400	94,800
PATRIOT	5,000	2.00	15,000	30,000
Fighter Sqdn	10,000		100,000	-
BE	600		-	-
MEB	45,667		-	-
MEF	137,000		411,000	-
IBCT	14,500		-	-
other 2	-		-	-
other 3	-		-	-
			Total	Total
			853,400	684,800

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	1.9
% Sustainment carried on VISA	75%

Total Transportation Requirement STONS (Above/Below the Line)											Totals
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD		
To:	Region 2										
Combat "+"	380,700	280,700	-	157,000	-	-	-	-	-		818,400
CS/CSS	407,400	207,400	-	-	-	-	-	-	-		614,800
Sustainment	309,273	166,773	-	9,500	-	-	49,875	-	-		535,420
Total Reqt	1,097,373	654,873	-	166,500	-	-	49,875	-	-		1,968,620
											% No Move
Actual	55.7%	33.3%	0.0%	8.5%	0.0%	0.0%	2.5%	0.0%	0.0%		5%

Figure 1. Screen Shot - Defining Force Requirements

Figure 1 depicts the user interface for defining the movement requirement. The user interface is intuitive to a uniformed or civilian military planner and also keeps the level of detail such that a more senior decision make does not become bogged down in the detail. The user is required to fill in the number of base type units apportioned and their location, the CSS support ratio for each type unit, and the ratio of sustainment appropriate for the scenario.

DEFINING THE SCENARIO

The transportation problem scenario elements include routing distances, infrastructure constraints, and the airlift and sealift fleets. The relationship between the origins and destinations is defined in terms of generalized geography and the use of average distances and cumulative port throughput representations. Figure 2 is the user interface. Estimated average routing distances are required for each onload/offload pair of air/seaports of embarkation (APOE/SPOE) and air/seaports of debarkation (APOE/APOD). Infrastructure capability estimates are required to represent the ability of the destination to receive the cargo, and the capacity of the en route infrastructure to support the movement of transportation assets through the system. It was assumed that CONUS infrastructure was sufficient and so this was not modeled or a focus for this exercise. The infrastructure capacities are represented by Maximum on Ground for the airfields and as berth constraints at sea ports. Maximum on Ground is the maximum number of aircraft an airfield can process simultaneously in a standard aircraft planning factor ground time. This planning factor is applied at origin, destination and en route air nodes. Sea berths are defined at the destination only since sealift assets generally do not require en route stops.

Figure 2. Screen Shot - Scenario Distances and Infrastructure Contraints

To: User APOD | Blue Cells: User Definable | Return

Air Route Distances 1 Way (NM)

	Origins	Region	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	7100	7000	7600	3000
A/SPOEs	CONUS W	8400	5400	6000	3000
A/SPOEs	EUCOM	3500	10000	9000	3000
A/SPOEs	JAPAN	6700	500	1000	3000
A/SPOEs	User APOE	7300	7300	7300	7963
A/SPODs	Region 1	0	7000	5500	3000
A/SPODs	Region 2	7000	0	800	3000
A/SPODs	Region 3	5500	800	0	3000
A/SPODs	User APOD	3000	3000	3000	0

Sea Distances 1 Way (NM)

	Origins	Region 1	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	8825	10430	10388	4000
A/SPOEs	CONUS W	11106	5201	5682	4000
A/SPOEs	EUCOM	6447	10842	10017	4000
A/SPOEs	JAPAN	1000	1000	1000	4000
A/SPOEs	User APOE	2000	2000	2000	8775
A/SPODs	Region 1	0	6183	5358	4000
A/SPODs	Region 2	6183	0	860	4000
A/SPODs	Region 3	5358	860	0	4000
A/SPODs	User APOD	4000	4000	4000	0

MOG Efficiency (Queueing Cost AFPAM10-1403): 85%

Strat Air ER MOG
i.e. ER Route Constraint
*Enter (1/2)*MOG for Route used both Inbound & Outbound*
Enter 99 for Unconstrained Routes

	Origins	Region	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E/W	9	9	4	8
A/SPOEs	EUCOM	2	2	4	8
A/SPOEs	JAPAN	0	99	4	8
A/SPOEs	User APOE	0	8	8	4
A/SPODs	Region 1	0	3	3	1
A/SPODs	Region 2	3	0	3	1
A/SPODs	Region 3	3	3	0	1
A/SPODs	User APOD	1	1	1	0

		APOD MOG	SPOD Berths
A/SPODs	Region 1	12	16
A/SPODs	Region 2	12	16
A/SPODs	Region 3	4	4
A/SPODs	User APOD	4	2

Figure 3 shows the user interface for defining the airlift fleet and aircraft performance characteristics for the scenario. General planning factors are available on the screen face as a reference for some of the required data elements. In the Strategic Mobility Quick-Look tool, organic aircraft and a generic representation of a commercial wide body were selected.

Blue Cells: User Definable
Light Yellow Cells: Computed From Data
To: Region 2
Airlift Productivity Factor (Repositioning Cost AFPAM10-1403): 94%
Return

FLEET	# Aircraft	UTE	Payload	Blk Speed	ER GT	APOD GT	MOG Equiv
C-141	10	12.1	19.0	394	2.25	2.25	0.50
C-17	60	15.15	57.0	410	2.25	2.25	1.00
C-5	84	10.7	78.0	409	4.25	3.25	1.00
KC-10	10	12.5	32.6	434	3.25	3.25	1.00
WB CRAF C	50	10	86.0	454	1.5	3.00	1.00
WB CRAF P	50	10	335	454	1.5	1.50	1.00

AFPAM 10-1403 Reference Data

	Payload	UTE
C-141	19.0	12.1
C-17	45.0	15.15
C-5	61.3	10.7
KC-10	32.6	12.5
WB CRAF C	86.0	10
WB CRAF P	335	10

Figure 3. Screen Shot – Airlift Fleet User Interface

Figure 4 shows the user interface for defining the sealift fleet to include basic operational characteristics for the ships. For the tool, a set of generally recognized ship types were selected. Also included is the percentage of unit cargo that can be containerized and moved on sea container capable ships. Additional sealift data not shown is also user selectable such as speeds and capacities.

Blue Cells: User Definable

Light Yellow Cells: Computed From Data (**do not change**)

	# Ships (or RONs)	Act. Day	SPOE/D Cgo Txf Time	Travel Time to SPOE for 1st Load	STONS
FSS	8	5	2	3	7,560
LMSR	11	5	2	3	12,398
LMSR Prepo	8	1	2	0	12,398
RORO	31	6	2	4	5,520
MPS RON	2	1	2	0	35,960
HSS	0	1	2	2	3,750
VISA I UE	9	8	2	7	4,937
VISA II UE	16	15	2	7	4,937
VISA III UE	0	45	2	7	4,937

% Containerizable UE	14%
Max # of Potential VISA UE Voyages/Ship	2

Figure 4. Screen Shot – Sealift Fleet User Interface

APPORTIONMENT OF ASSETS

Generally, all available transportation assets are not apportioned to a single scenario, nor is the level of asset apportionment for a scenario constant through out. Addressing apportionment questions is important for planners and decision makers who need the capacity to represent the impact of a competing scenario. In Figure 5, the Strategic Mobility Quick-Look tool provides the user with the ability to change the percentage level of asset apportionment to the scenario being assessed up to three times.

	Strat Lift Apportionment		
	Scenario	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 30	100%	100%
Change 2	Day 65	100%	100%
Change 3	Day 100	100%	100%

Figure 5. Screen Shot – Lift Apportionment User Interface

CALCULATIONS

The analytical approach used to represent the performance of the transportation system and thus answer the rough transportation feasibility questions were standard planning factor throughput formula which account for time, distance, infrastructure constraints and asset capabilities.

1. Airlift Calculations:

    a. Define the air fleet parameters: # aircraft, Use rates (hours/day), payloads, speeds, and required ground times.

    b. Define routing distances and airfield infrastructure constraints (MOGs).

c. Assumptions:
   i. The fleet is available on day one and it delivers as much as it can within infrastructure constraints (not cargo starved). This includes CRAF aircraft.
   ii. If CRAF aircraft is carrying more than user defined maximum, the user will receive a warning message to reduce CRAF.
   iii. Assume that airlift capacity will be distributed proportionally based on the cargo associated with the aerial port of embarkation (APOE) and aerial port of debarkation (APOD) pairs.
   iv. Airlift Productivity factor (<=1) will be used to represent repositioning inefficiencies. It will reduce the number of cycles per day per aircraft.
   v. MOG Queueing efficieny (<=1) will be used to represent queueing/scheduling inefficiencies.

d. Calculate round trip flying time (RTFT) for each aircraft type which equals round trip distance divided by aircraft flying speed.

e. Calculate round trip ground time (RTGT) for each aircraft type: onload ground time + (number of en routes) x (en route ground time) + offload ground time.

f. Compute round trip cycles per day (RTC/day) for each aircraft type: Minimum of 24/(RTFT+RTGT) or USE/RTFT.

g. Compute Aircraft Daily Throughput for each aircraft type: (RTC/day) x (aircraft payload). This can be done separately for Tons and Pax.

h. Compute Daily Airlift Fleet Throughput: Sum over all aircraft types the (Daily Aircraft Throughput) x (#of fleet aircraft).

i. Compute Required MOG at each airfield (or set of airfields) to Maximize Fleet Potential. For instance the total MOG required over the set of en route airfields supporting a route is computed by summing over all aircraft types: (RTC/day) x (# of aircraft) x (en route ground time)/24]/(queueing efficiency).

j. Compute Daily Fleet Throughput Capacity: the minimum of the following calculation done for each airfield in the route or set of airfields representing a throughput node such as the en route [(Defined Airfield MOG)/(Airfield MOG Required to Maximize Fleet Potential)] x (Daily Fleet Throughput Potential) x (Productivity Factor).

2. Sealift Calculations:

   a. Define the sea fleet parameters: # ships, payloads by ship type, activation day by ship type, cargo transfer time at onload/offload, time to get to first seaport of embarkation (SPOE) once ship is activated.

   b. Define sealift routing distances and SPOE and seaport of debarkation (SPOD) infrastructure constraints (berths).

   c. Assume that ship capacity will be distributed proportionally based on the cargo associated with the SPOE and SPOD pairs.

   d. For each ship type compute daily throughput taking into account the activation day, travel time to SPOE, cargo transfer times at SPOE and SPOD, and arrival dates of cargo to SPOD based on distance divided by ship speed to and from the SPOD. Each ship type will have cargo arrive on one day of the cycle. Unlike airlift there is not a calculated notion of average cargo per ship per day.

e. If commercial sealift represented by (VISA ships) is delivering more than a user-defined maximum, the user will recieve a warning.

PRESENTATION OF RESULTS

For this Strategic Mobility Quick-Look tool, the presentation of results was customized to be intuitive and quickly understood so that decisions about transportation feasibility, risk and allocation of finite resources could be made. The cumulative closure graph, a commonly used presentation for transportation feasibility is the heart of the main display screen shown in Figure 6. Using this display, the decision maker can quickly see the total force requirement can be closed in about 100 days using defined infrastructure and the apportioned transportation assets. Additional insight is available from the display of warning flags for key areas, infrastructure results, and a general summary of the movement requirement. On the main screen, the user is also provided with the capability to change asset apportionments which has proven extremely useful for answering questions about the impact of other high-priority competing requirements. All of the user input screens are accessible from the buttons at the top of the main display. Buttons are also included to change the graph to air or sea only and to change the number of days displayed on the graph, providing the user with flexibility to quickly insert a customized graph into briefings.

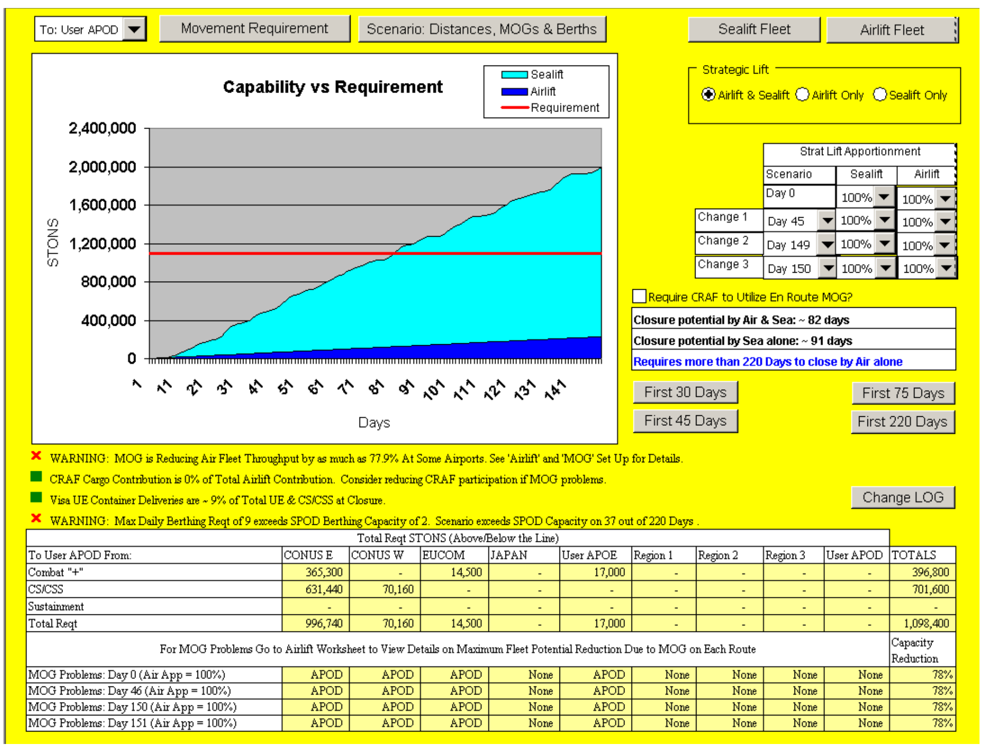

Figure 6. Screen Shot – Main Results Screen

CONCLUSION

The U.S. Transportation Command generally relies upon detailed models and simulations to determine the transportation feasibility of a specific deployment scenario. However, on many occasions, more detailed simulations are impractical due to a lack of firm details and data parameters to drive these models or due to time constraints, and reliable quick-turn solutions and insights are needed. In these cases, we require a tool that can be set-up promptly, often times using default or planning data, in order to obtain a quick assessment of the situation. The Strategic Mobility Quick-Look tool presented herein is one such example available to U.S. transportation planners for quick-turn initial insights when assessing diverse scenarios, deployment requirements, and operations concepts. It provides the leadership with the capability to focus on the big picture and address the overriding issues related to scenario feasibility and closure. It can also prove invaluable in formal analytical studies by providing the focus for subsequent higher fidelity modeling and the use of increasingly scares and expensive resources.

QUICK STRATEGIC FORCE CLOSURE FOR ROUGHLY DEFINED FORCES

Bill Key
US Transportation Command
Joint Mobility Analysis Center

Why?

- New emerging requirements
  - New challenges
  - Small scale contingencies
- Need for “Quick Look” Tool
  - Leadership wargaming
  - Study scoping
  - Analytical focus

Approach

- Intuitive Interface
- Tailorable Requirement
  – Multiple Origins
- Defined Defense Transportation System
  – Assets – Aircraft and Ships
  – Ports of Embarkation
  – Ports of Debarkation
  – En Route Airports

Intuitive User Interface

Excel Based

- DOD office standard
- Easily understood graphics
- Ease of use – point and click
- Tailorable to user
- Rapid prototyping

Requirements Definition

- Combat Force
  - Major Formations
- Supporting Force
  - Tooth to Tail Ratio
- Sustainment
  - Consumption Ratio

Combat Force

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data		
Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdn	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary	
Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by Origin										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Major Units and Origins

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	66%

Total Transportation Requirement STONS (Above/Below the Line)									
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-

Totals
626,234
793,400
241,338
1,660,972

Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

% No Move
0%

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Combat Force

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data		
Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdn	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary	
Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by Origin										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	66%

Total Transportation Requirement STONS (Above/Below the Line)									
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-
Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Totals
626,234
793,400
241,338
1,660,972

% No Move
0%

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Major Units and Origins

Lift Requirement

CS/CSS Force

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data		
Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdn	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary	
Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Tooth to Tail Ratio

Distribution Percentage of CS/CSS & Sustainment STONS by origin										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	66%

Total Transportation Requirement STONS (Above/Below the Line)									
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-

Totals
626,234
793,400
241,338
1,660,972

Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

% No Move
0%

<u>Notes</u>:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

CS/CSS Force

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data		
Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdn	5,000	6.00
BE	600	3.00
MEB	45,66	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary	
Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by origin										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	66%

Total Transportation Requirement STONS (Above/Below the Line)									
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-
Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Totals
626,234
793,400
241,338
1,660,972

% No Move
0%

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Tooth to Tail Ratio

Origin Distribution

Lift Requirement

Sustainment

Scenario
To: Region 1

Blue Cells: User Definable	Light Yellow Cells: Computed From Data

Return

 # Combat Units Required (Above the Line)

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data

Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdr	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary

Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by origin

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	[illegible]

Sustainment Ratio

Total Transportation Requirement STONS (Above/Below the Line)

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-
Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Totals
626,234
793,400
241,338
1,660,972

% No Move
0%

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Sustainment

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

# Combat Units Required (Above the Line)										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data		
Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdi	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary	
Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by origin										
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)	
Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	[illegible]

Total Transportation Requirement STONS (Above/Below the Line)									
From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 1								
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-
CS/CSS	476,040	317,360	-	-	-	-	-	-	-
Sustainment	144,803	96,535	-	-	-	-	-	-	-
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-
Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Totals
626,234
793,400
241,3[illegible]
1,660,972

% No Move
0%

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Origin Distribution

Sustainment Ratio

Lift Requirement

Requirement Summary

Scenario
To: Region 1

Blue Cells: User Definable
Light Yellow Cells: Computed From Data

Return

 # Combat Units Required (Above the Line)

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
Hvy Bde	1									1
Lt Bde	1		1							2
PATRIOT	3									3
Fighter Sqdn		3								3
BE	1									1
MEB	2									2
MEF	1									1
IBCT			1							1
Air Aslt Bde		1								1
Other 2										0

Reference Data

Type Unit	Combat "+" STONS	CS/CSS to Combat "+"
Hvy Bde	35,000	2.00
Lt Bde	7,900	2.00
PATRIOT	100,000	2.00
Fighter Sqdn	5,000	6.00
BE	600	3.00
MEB	45,667	
MEF	137,000	
IBCT	14,500	
Air Aslt Bde	17,000	
Other 2	10,000	

Requirement Summary

Combat "+"	CS/CSS
35,000	70,000
15,800	31,600
300,000	600,000
15,000	90,000
600	1,800
91,334	-
137,000	-
14,500	-
17,000	-
-	-
Total	Total
626,234	793,400

Distribution Percentage of CS/CSS & Sustainment STONS by origin

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Total
%	60%	40%	0%	0%	0%	0%	0%	0%	0%	100%

Planing Factors (Below the Line)

Sustainment Ratio for (Combat "+" & CS/CSS)	0.5
% Sustainment carried on VISA	66%

Total Transportation Requirement STONS (Above/Below the Line)

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	Totals
To:	Region 1									
Combat "+"	571,834	32,000	22,400	-	-	-	-	-	-	626,234
CS/CSS	476,040	317,360	-	-	-	-	-	-	-	793,400
Sustainment	144,803	96,535	-	-	-	-	-	-	-	241,338
Total Reqt	1,192,677	445,895	22,400	-	-	-	-	-	-	1,660,972
										% No Move
Actual	71.8%	26.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0%

Total Lift Requirement by Origin

Notes:

1. For Some units, particularly non-Army units, it is difficult if not impossible to pull out the specific CS/CSS STONS so that a ratio can be defined. In these cases, total STONS can be indicated in the Combat "+" column.
2. Sustainment requirements for In-place units are treated as transportation requirements.
3. The "Other" Rows in the requirement table can be used for another specific unit or to represent a lump sum of STONS that cannot be easily categorized.

Sustainment Ratio for (Combat "+" & CS/CSS) Carried on Organic	17%

Closure Calculation

- Calculate cycle time per asset for each origin – destination pair
- Determine asset contribution
  - Aircraft tons per day
  - Sealift ship type tons per day
- Project accumulated closure per day

Airlift Contribution

- Aircraft defined by type
  - Standard Air Mobility Command Planning Factors
- User defined air network
  - Distances
  - MOGs

Airlift Assets

Blue Cells: User Definable	To: Region 3
Light Yellow Cells: Computed From Data	

Airlift Productivity Factor (Repositioning Cost AFPAM10-1403) 94%

Return

FLEET	# Aircraft	UTE	STON Payload	Pax Payload	Blk Speed	ER GT	APOD GT	MOG Equiv
C-141	0	9.7	19.0	10.0	394	2.25	2.25	1.00
C-17	95	13.94	45.0	0.0	410	2.25	2.25	1.00
C-5	99	8.4	61.3	0.0	409	4.25	3.25	1.00
KC-10	0	12.5	32.6		434	3.25	3.25	1.00
CRAF CARGO	0	10	55.0		444	4.25	3.00	1.00
CRAF PAX	10	10	0.0	280	439	1.5	2.00	1.00

AFPAM 10-1403 Reference Data

	Payload	Cont. USE	PM Fleet
C-141	19.0	9.7	28
C-17	45.0	13.9	45
C-5	61.3	8.4	37
KC-10	32.6	12.5	0
B747 C	86.0	10	25
B 747 P	335	10	25

From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD
To:	Region 3	Region 3	Region 3	Region 3	Region 3	Region 3	Region 3	Region 3	Region 3
Req't Distribution by APOE	72%	27%	1%	0%	0%	0%	0%	0%	0%
Air Capacity Distribution	76%	22%	2%	0%	0%	0%	0%	0%	0%

CRAF % Warning 10%

Day 0 Summary (Air Apportionment = 100%)										
% Lift Capacity Reduction due to MOG	52.56%	52.56%	48.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Constraint ID	ER	ER	APOD	None	None	None	None	None	None	
Total Actual Cargo Fleet	1,008	377	21	-	-	-	-	-	-	1,406
Total Actual Pax Fleet	274	102	6	-	-	-	-	-	-	382

Day 45 Summary (Air Apportionment = 100%)										
% Lift Capacity Reduction due to MOG	52.56%	52.56%	48.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Constraint ID	ER	ER	APOD	None	None	None	None	None	None	
Total Actual Cargo Fleet	1,008	377	21	-	-	-	-	-	-	1,40
Total Actual Pax Fleet	274	102	6	-	-	-	-	-	-	38

Day 149 Summary (Air Apportionment = 100%)										
% Lift Capacity Reduction due to MOG	52.56%	52.56%	48.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Constraint ID	ER	ER	APOD	None	None	None	None	None	None	
Total Actual Cargo Fleet	1,008	377	21	-	-	-	-	-	-	1,406
Total Actual Pax Fleet	274	102	6	-	-	-	-	-	-	382

Day 150 Summary (Air Apportionment = 100%)										
% Lift Capacity Reduction due to MOG	52.56%	52.56%	48.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Constraint ID	ER	ER	APOD	None	None	None	None	None	None	
Total Actual Cargo Fleet	1,008	377	21	-	-	-	-	-	-	1,406
Total Actual Pax Fleet	274	102	6	-	-	-	-	-	-	382

Aircraft Characteristics

STONS/day Details by AC

PAX/day Details by AC

Notes:

1. Assume Fleet Available on Day 1
2. Airlift Fleet Delivers as much as can (I.e. not Cargo Starved -- no Mode Select)
3. Assume Airfleet tackles requirement roughly in proportions it's distributed from APOEs to APOD.
4. WB CRAF cargo contribution is 0%. Consider reducing CRAF if this represents greater than 25% of total cargo requirement.
5. MOG Constraints will be Identified. Consider reducing CRAF Overall Contribution if MOG Problems.
6. Airlift Productivity factor (AFPAM 10-1403) represents repositioning inefficiencies. It will reduce the number of cycles per day per aircraft.
7. MOG Queueing efficieny (AFPAM 10-1403) represents queueing/scheduling inefficiencies.

Airlift Scenario Data

To: Region 3

Blue Cells: User Definable

Return

Air Route Distances 1 Way (NM)

	Origins	Region	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	7100	7000	7600	3000
A/SPOEs	CONUS W	8400	5400	6000	3000
A/SPOEs	EUCOM	3500	10000	9000	3000
A/SPOEs	JAPAN	6700	500	1000	3000
A/SPOEs	User APOE	7300	7300	7300	7963
A/SPODs	Region 1	0	7000	5500	3000
A/SPODs	Region 2	7000	0	800	3000
A/SPODs	Region 3	5500	800	0	3000
A/SPODs	User APOD	3000	3000	3000	0

Sea Distances 1 Way (NM)

	Origins	Region 1	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	8825	10430	10388	4000
A/SPOEs	CONUS W	11106	5201	5682	4000
A/SPOEs	EUCOM	6447	10842	10017	4000
A/SPOEs	JAPAN	1000	1000	1000	4000
A/SPOEs	User APOE	2000	2000	2000	8775
A/SPODs	Region 1	0	6183	5358	4000
A/SPODs	Region 2	6183	0	860	4000
A/SPODs	Region 3	5358	860	0	4000
A/SPODs	User APOD	4000	4000	4000	0

MOG Efficiency (Queueing Cost AFPAM10-1403)

85%

Strat Air ER MOG
i.e. ER Route Constraint

*Enter (1/2)*MOG for Route used both Inbound & Outbound*

Enter 99 for Unconstrained Routes

	Origins	Region	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E/W	9	9	4	8
A/SPOEs	EUCOM	2	2	4	8
A/SPOEs	JAPAN	0	99	4	8
A/SPOEs	User APOE	0	8	8	4
A/SPODs	Region 1	0	3	3	1
A/SPODs	Region 2	3	0	3	1
A/SPODs	Region 3	3	3	0	1
A/SPODs	User APOD	1	1	1	0

		APOD MOG	SPOD Berths
A/SPODs	Region 1	12	16
A/SPODs	Region 2	12	16
A/SPODs	Region 3	4	4
A/SPODs	User APOD	4	2

Airlift Network

Airlift Scenario Data

To: Region 3

Blue Cells: User Definable

Return

Air Route Distances 1 Way (NM)

	Origins	Region	Region 2	Region 3	User APOD
A/SPOEs	CONUS E	7100	7000	7600	3000
A/SPOEs	CONUS W	8400	5400	6000	3000
A/SPOEs	EUCOM	3500	10000	9000	3000
A/SPOEs	JAPAN	6700	500	1000	3000
A/SPOEs	Use[illegible]	[illegible]	[illegible]00	7300	7963
A/SPODs	Reg[illegible]	[illegible]	[illegible]00	5500	3000
A/SPODs	Reg[illegible]	[illegible]	0	800	3000
A/SPODs	Reg[illegible]	[illegible]	[illegible]00	0	3000
A/SPODs	User APOD	3000	3000	3000	0

Destinations

Destination Theater MOG

Sea Distances 1 Way (NM)

	Origins	Region 1	Region 2	Region 3	User APOD
A/SPOEs	CONUS E	8825	10430	10388	4000
A/SPOEs	CONUS W	11106	5201	5682	4000
A/SPOEs	EUCOM	6447	10842	10017	4000
A/SPOEs	JAPAN	1000	1000	1000	4000
A/SPOEs	User APOE	2000	2000	2000	8775
A/SPODs	Region 1	0	6183	5358	4000
A/SPODs	Region 2	6183	0	860	4000
A/SPODs	Region 3	5358	860	0	4000
A/SPODs	User APOD	4000	4000	4000	0

Destinations

MOG Efficiency (Queueing Cost AFPAM10-1403)

85%

Strat Air ER MOG
i.e. ER Route Constraint

*Enter (1/2)*MOG for Route used both Inbound & Outbound*

Enter 99 for Unconstrained Routes

	Origins	Region	Region 2	Region 3	User APOD
A/SPOEs	CONUS E/W	9	9	4	8
A/SPOEs	EUCOM	2	2	4	8
A/SPOEs	JAPAN	0	99	4	8
A/SPOEs	User APOE	0	8	8	4
A/SPODs	Region 1	0	3	3	1
A/SPODs	Region 2	3	0	3	1
A/SPODs	Region 3	3	3	0	1
A/SPODs	User APOD	1	1	1	0

Destinations

		APOD MOG	SPOD Berths
A/SPODs	Region 1	12	16
A/SPODs	Region 2	12	16
A/SPODs	Region 3	4	4
A/SPODs	User APOD	4	2

Airlift Scenario Data

To: Region 3

Blue Cells: User Definable

Return

	Air Route Distances 1 Way (NM)			
	Destinations			
Origins	Region	Region 2	Region 3	User APOD
A/SPOEs				
CONUS E	7100	7000	7600	3000
CONUS W	8400	5400	6000	3000
EUCOM	3500	10000	9000	3000
JAPAN	6700	500	1000	3000
User APOE	7300	7300	7300	7963
A/SPODs				
Region 1	0	7000	5500	3000
Region 2	7000	0	800	3000
Region 3	5500	800	0	3000
User APOD	3000	3000	3000	0

	Sea Distances 1 Way (NM)			
	Destinations			
Origins	Region 1	Region 2	Region 3	User APOD
A/SPOEs				
CONUS E	8825	10430	10388	4000
CONUS W	11106	5201	5682	4000
EUCOM	6447	10842	10017	4000
JAPAN	1000	1000	1000	4000
User APOE	2000	2000	2000	8775
A/SPODs				
Region 1	0	6183	5358	4000
Region 2	6183	0	[illegible]	[illegible]
Region 3	5358	860	[illegible]	[illegible]
User APOD	4000	4000	[illegible]	[illegible]

En Route MOGS

MOG Efficiency (Queueing Cost AFPAM10-1403)

85%

Strat Air ER MOG
i.e. ER Route Constraint
*Enter (1/2)*MOG for Route used both Inbound & Outbound*
Enter 99 for Unconstrained Routes

	Destinations			
Origins	Region	Region 2	Region 3	User APOD
A/SPOEs				
CONUS E/W	9	9	4	8
EUCOM	2	2	4	8
JAPAN	0	99	4	8
User APOE	0	8	8	4
A/SPODs				
Region 1	0	3	3	1
Region 2	3	0	3	1
Region 3	3	3	0	1
User APOD	1	1	1	0

A/SPODs	APOD MOG	SPOD Berths
Region 1	12	16
Region 2	12	16
Region 3	4	4
User APOD	4	2

Sealift Contribution

- Ship Types
  - Number
  - Capacity
  - Operational Data
- VISA
  - Percent Cargo on VISA
  - Percent Cargo Containerized
- User defined sea network
  - Distances
  - Berths

Sealift Assets

Return

Blue Cells: User Definable
Light Yellow Cells: Computed From Data (**do not change**)

	# Ships (or RONs)	Act. Day	SPOE/D Cgo Txf Time	Travel Time to SPOE for 1st Load	STONS
FSS	5	5	2	3	7,560
LMSR	5	0	1	0	9,918
LMSR Prepo	5	17	2	0	12,398
RORO	5	6	2	4	5,520
MPS RON	2	1	2	0	35,960
HSS	0	1	2	2	3,750
VISA I UE	5	8	2	7	4,937
VISA II UE	5	15	2	7	4,937
VISA III UE	0	45	2	7	4,937

% Containerizable UE	22%
Max # of Potential VISA UE Voyages/Ship	2

Notes:

FSS: <=8

LMSR: <=11 on 1st scenario, <=19 on subsequent scenarios

LMSR Prepo: <=8 on 1st scenario, =0 on subsequent scenarios

Activation Day is the 1st day ship can move or be used

Prepo ships have no Travel Time to SPOE to pick up first load

Prepo ships do not use prepo origin for 1st load (will implement at a later date)

MPS RON represents a squadron of 5 ships. Three ships (60%) will make multiple voyages and 2 will remain in theater after arriving.

Sealift Scenario Data

To: Region 3

Blue Cells: User Definable

Return

Air Route Distances 1 Way (NM)

	Origins	Region 1	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	7100	7000	7600	3000
A/SPOEs	CONUS W	8400	5400	6000	3000
A/SPOEs	EUCOM	3500	10000	9000	3000
A/SPOEs	JAPAN	6700	500	1000	3000
A/SPOEs	User APOE	7300	7300	7300	7963
A/SPODs	Region 1	0	7000	5500	3000
A/SPODs	Region 2	7000	0	800	3000
A/SPODs	Region 3	5500	800	0	3000
A/SPODs	User APOD	3000	3000	3000	0

Sea Distances 1 Way (NM)

	Origins	Region 1	Region 2	Region 3	User APOD
		Destinations			
A/SPOEs	CONUS E	8825	10430	10388	4000
A/SPOEs	CONUS W	11106	5201	5682	4000
A/SPOEs	EUCOM	6447	10842	10017	4000
A/SPOEs	JAPAN	1000	1000	1000	4000
A/SPOEs	User APOE	2000	2000	2000	8775
A/SPODs	Region 1	0	6183	5358	4000
A/SPODs	Region 2	6183	0	860	4000
A/SPODs	Region 3	5358	860	0	4000
A/SPODs	User APOD	4000	4000	4000	0

MOG Efficiency (Queueing Cost AFPAM10-1403)

85%

Strat Air ER MOG
i.e. ER Route Constraint
*Enter (1/2)*MOG for Route used both Inbound & Outbound*
Enter 99 for Unconstrained Routes

	Origins	Region [illegible]	[illegible]	[illegible]on 3	User APOD
A/SPOEs	CONUS E/W	9	[illegible]	4	8
A/SPOEs	EUCOM	2	2	4	8
A/SPOEs	JAPAN	0	99	4	8
A/SPOEs	User APOE	0	8	8	4
A/SPODs	Region 1	0	3	3	1
A/SPODs	Region 2	3	0	3	1
A/SPODs	Region 3	3	3	0	1
A/SPODs	User APOD	1	1	1	0

Sealift Network

		APOD MOG	SPOD Berths
A/SPODs	Region 1	12	16
A/SPODs	Region 2	12	16
A/SPODs	Region 3	4	4
A/SPODs	User APOD	4	2

Sealift Scenario Data

To: Region 3

Blue Cells: User Definable

Return

Air Route Distances 1 Way (NM)

	Origins	Destinations: Region	Region 2	Region 3	User APOD
A/SPOEs	CONUS E	7100	7000	7600	3000
A/SPOEs	CONUS W	8400	5400	6000	3000
A/SPOEs	EUCOM	3500	10000	9000	3000
A/SPOEs	JAPAN	6700	500	1000	3000
A/SPOEs	User APOE	7300	7300	7300	7963
A/SPODs	Region 1	0	7000	5500	3000
A/SPODs	Region 2	7000	0	800	3000
A/SPODs	Region 3	5500	800	0	3000
A/SPODs	User APOD	3000	3000	3000	0

Sea Distances 1 Way (NM)

	Origins	Destinations: Region 1	Region 2	Region 3	User APOD
A/SPOEs	CONUS E	8825	10430	10388	4000
A/SPOEs	CONUS W	11106	5201	5682	4000
A/SPOEs	EUCOM	6447	10842	10017	4000
A/SPOEs	JAPAN	1000	1000	1000	4000
A/SPOEs	User APOE	2000	2000	2000	8775
A/SPODs	Region 1	0	6183	5358	4000
A/SPODs	Region 2	6183	0	860	4000
A/SPODs	Region 3	5358	860	0	4000
A/SPODs	User APOD	4000	4000	4000	0

MOG Efficiency (Queueing Cost AFPAM10-1403)

85%

Strat Air ER MOG
i.e. ER Route Constraint

*Enter (1/2)*MOG for Route used both Inbound & Outbound*

Enter 99 for Unconstrained Routes

	Origins	Destinations: Region	Region 2	Region 3	User APOD
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A/SPOEs	EUCOM	2	2	4	8
A/SPOEs	JAPAN	0	99	4	8
A/SPOEs	User APOE	0	8	8	4
A/SPODs	Region 1	0	3	3	1
A/SPODs	Region 2	3	0	3	1
A/SPODs	Region 3	3	3	0	1
A/SPODs	User APOD	1	1	1	0

Destination Theater Berths

		APOD MOG	SPOD Berths
A/SPODs	Region 1	12	16
A/SPODs	Region 2	12	16
A/SPODs	Region 3	4	4
A/SPODs	User APOD	4	2

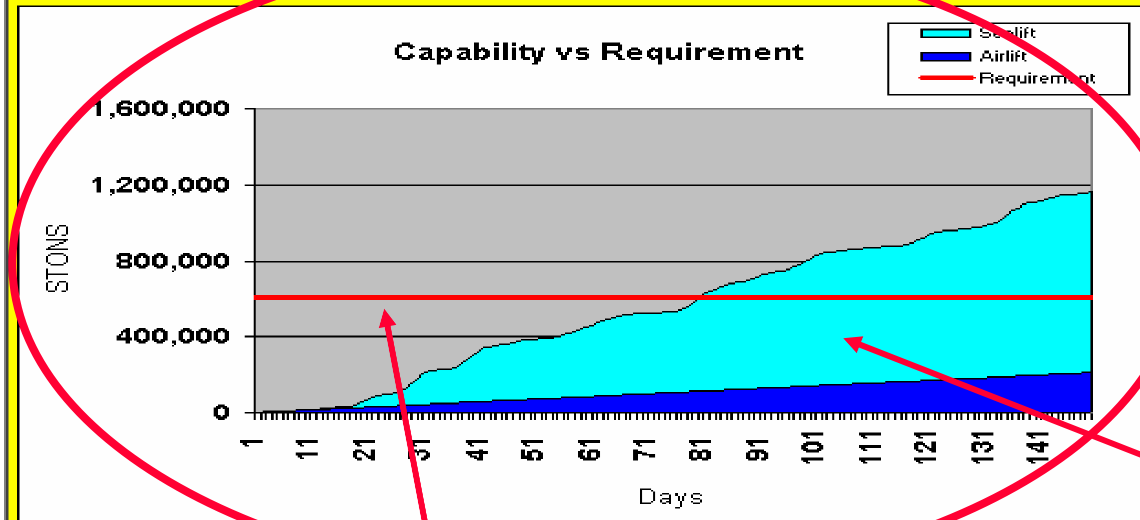
Scenario Summary

- Closure Graphic
- Strategic Lift Apportionment
- Requirements Summary
- Warning Flags
- MOG constraints

Scenario Summary

To: Region 3

Movement Requirement | Scenario: Distances, MOGs & | Sealift Fleet | Airlift Fleet



Strategic Lift

Airlift & Sealift | Airlift Only | Sealift Only

Strat Lift Apportionment			
	Scenario Day	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 45	100%	100%
Change 2	Day 149	100%	100%
Change 3	Day 150	100%	100%

Require CRAF to Utilize En Route MOG?

Closure potential by Air & Sea: ~ 81 days

Closure potential by Sea alone: ~ 93 days

Requires more than 220 Days to close by Air alone

First 30 Days | First 75 Days | First | First 220 Days

Cumulative Closure

Change LOG

WARNING: MOG is Reducing Air Fleet Throughput by as much as 52.1% At Some Airport. See 'Airlift' and 'MOG' Set Up for Details.

CRAF Cargo Contribution is 0% of Total Airlift Contribution. Consider reducing CRAF participation if MOG problems.

Visa UE Container Deliveries are ~ 11% of Total UE & CS/CSS at Closure.

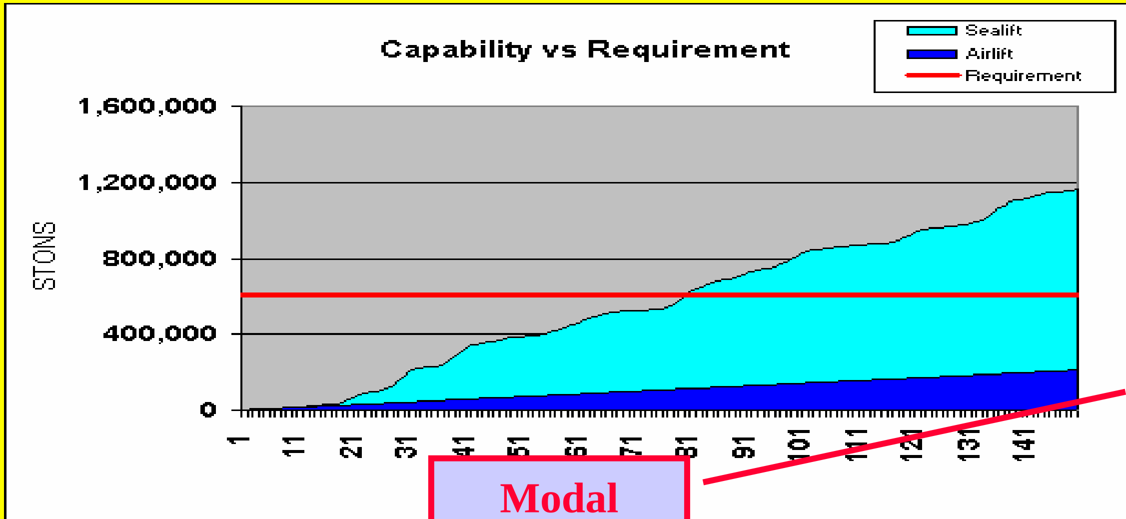
WARNING: Max Daily Berthing Reqt of 6 exceeds SPOD Berthing Capacity of 4. Scenario exceeds SPOD Capacity on 1 out of 220 Days .

Total Requirement

Total Reqt STONS (Above/Below the Line)										
To Region 3 From:			UCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	TOTALS
Combat "+"			22,400	-	-	-	-	-	-	326,234
CS/CSS			-	-	-	-	-	-	-	193,400
Sustainment			-	-	-	-	-	-	-	88,338
Total Reqt			22,400	-	-	-	-	-	-	607,972
For MOG Problems Go to Airlift Worksheet to View Details on Maximum Fleet Potential Reduction Due to MOG on Each Route										Capacity Reduction
MOG Problems: Day 0 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 46 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 150 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 151 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%

Scenario Summary

To: Region 3 | Movement Requirement | Scenario: Distances, MOGs & | Sealift Fleet | Airlift Fleet



Strategic Lift: Airlift & Sealift / Airlift Only / Sealift Only

	Strat Lift Apportionment		
	Scenario Day	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 45	100%	100%
Change 2	Day 149	100%	100%
Change 3	Day 150	100%	100%

Require CRAF to Utilize En Route MOG?

Closure potential by Air & Sea: ~ 81 days

Closure potential by Sea alone: ~ 93 days

Requires more than 220 Days to close by Air alone

First 30 Days | First 75 Days | First 45 Days | First 220 Days

Modal Snapshots

WARNING: MOG is Reducing Air Fleet Th... At Some Airports. See 'Airlift' and 'MOG' Set Up for Details.

CRAF Cargo Contribution is 0% of Total A... educing CRAF participation if MOG problems.

Visa UE Container Deliveries are ~ 11% of Total UE & CS/CSS at Closure.

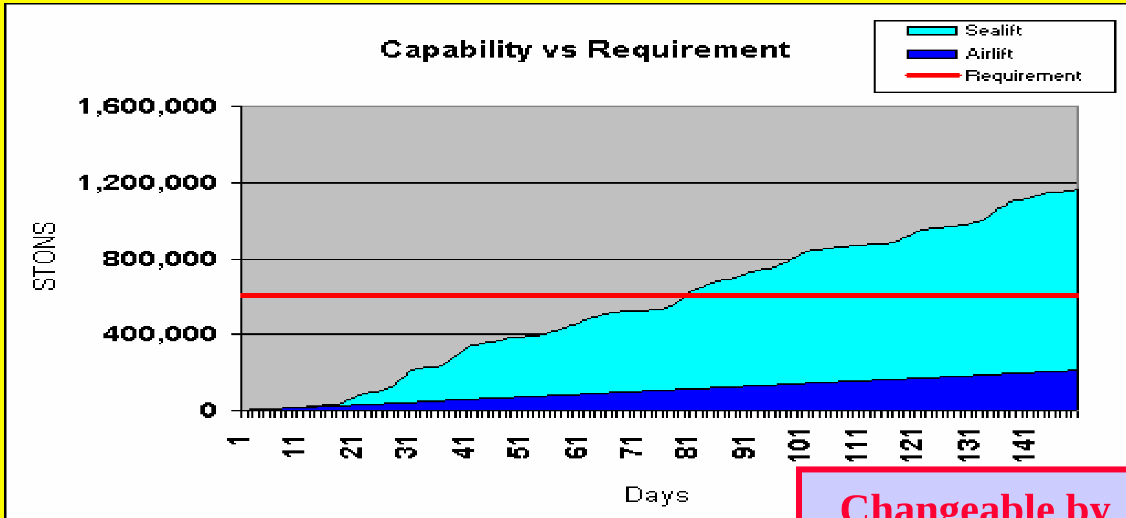
WARNING: Max Daily Berthing Reqt of 6 exceeds SPOD Berthing Capacity of 4. Scenario exceeds SPOD Capacity on 1 out of 220 Days .

Change LOG

Total Reqt STONS (Above/Below the Line)										
To Region 3 From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	TOTALS
Combat "+"	271,834	32,000	22,400	-	-	-	-	-	-	326,234
CS/CSS	116,040	77,360	-	-	-	-	-	-	-	193,400
Sustainment	53,003	35,335	-	-	-	-	-	-	-	88,338
Total Reqt	440,877	144,695	22,400	-	-	-	-	-	-	607,972
For MOG Problems Go to Airlift Worksheet to View Details on Maximum Fleet Potential Reduction Due to MOG on Each Route										Capacity Reduction
MOG Problems: Day 0 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 46 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 150 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 151 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%

Asset Apportionment

To: Region 3 | Movement Requirement | Scenario: Distances, MOGs & | Sealift Fleet | Airlift Fleet



Strategic Lift

Airlift & Sealift — Airlift Only — Sealift Only

	Strat Lift Apportionment		
	Scenario Day	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 45	100%	100%
Change 2	Day 149	100%	100%
Change 3	Day 150	100%	100%

Require CRAF to Utilize En Route MOG?

Closure potential by Air & Sea: ~ 81 days

Closure potential by Sea alone: ~ 93 days

Requires more than 220 Days to close by Air alone

First 30 Days | First 45 Days | First 75 Days | First 220 Days

Changeable by Scenario Day

WARNING: MOG is Reducing Air Fleet Throughput by as much as 52.1% At Some A… r Details.

CRAF Cargo Contribution is 0% of Total Airlift Contribution. Consider reducing CR…

Visa UE Container Deliveries are ~ 11% of Total UE & CS/CSS at Closure.

Change LOG

WARNING: Max Daily Berthing Reqt of 6 exceeds SPOD Berthing Capacity of 4. Scenario exceeds SPOD Capacity on 1 out of 220 Days .

Total Reqt STONS (Above/Below the Line)										
To Region 3 From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	TOTALS
Combat "+"	271,834	32,000	22,400	-	-	-	-	-	-	326,234
CS/CSS	116,040	77,360	-	-	-	-	-	-	-	193,400
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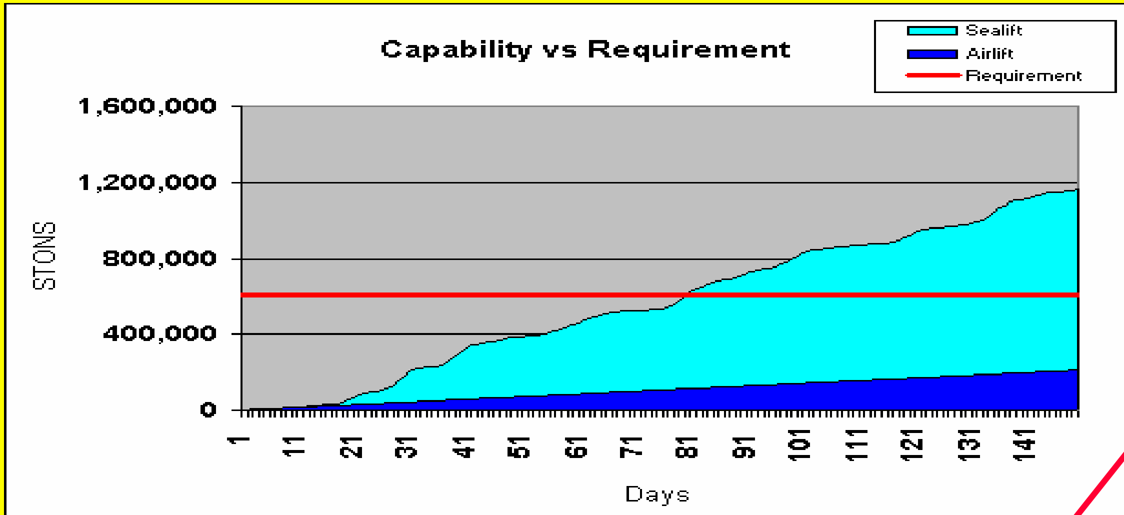
For MOG Problems Go to Airlift Worksheet to View Details on Maximum Fleet Potential Reduction Due to MOG on Each Route										Capacity Reduction
MOG Problems: Day 0 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 46 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 150 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 151 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%

Scenario Summary

To: Region 3 | Movement Requirement | Scenario: Distances, MOGs & | Sealift Fleet | Airlift Fleet



Strategic Lift

Airlift & Sealift | Airlift Only | Sealift Only

Strat Lift Apportionment			
	Scenario Day	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 45	100%	100%
Change 2			100%
			100%

Require CRAF

Closure potenti

Closure potenti

Requires more than 220 Days to close by Air alone

Requirement Summary

First 30 Days | First 75 Days | First 45 Days | First 220 Days

WARNING: MOG is Reducing Air Fleet Throughput by as much as 52.1% At Some Airports. See 'Airlift' and 'MOG' Set Up for Details.

CRAF Cargo Contribution is 0% of Total Airlift Contribution. Consider reducing CRAF participation if MOG problems.

Visa UE Container Deliveries are ~ 11%

WARNING: Daily Berthing Reqt of 6 exceeds SPOD Berthing Capacity of 4. Scenario exceeds SPOD Capacity 1 out of 220 Days .

Change LOG

Total Reqt STONS (Above/Below the Line)										
To Region 3 From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	User APOD	TOTALS
Combat "+"	271,834	32,000	22,400	-	-	-	-	-	-	326,234
CS/CSS	116,040	77,360	-	-	-	-	-	-	-	193,400
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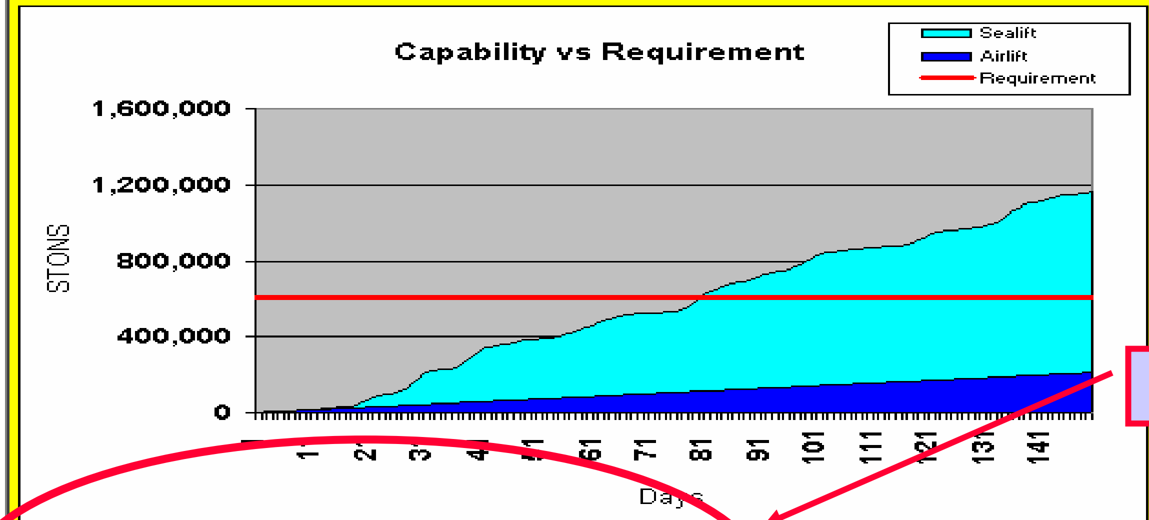
For MOG Problems Go to Airlift Worksheet to View Details on Maximum Fleet Potential Reduction Due to MOG on Each Route										Capacity Reduction
MOG Problems: Day 0 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 46 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 150 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 151 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%

Scenario Summary

To: Region 3 | Movement Requirement | Scenario: Distances, MOGs & | Sealift Fleet | Airlift Fleet



Strategic Lift: (•) Airlift & Sealift ( ) Airlift Only ( ) Sealift Only

Strat Lift Apportionment			
	Scenario Day	Sealift	Airlift
	Day 0	100%	100%
Change 1	Day 45	100%	100%
Change 2	Day 149	100%	100%
Change 3	Day 150	100%	100%

☑ Require CRAF to Utilize En Route MOG?

Alert Flags

& Sea: ~ 81 days

alone: ~ 93 days

Days to close by Air alone

First 30 Days | First 45 Days | First 75 Days | First 220 Days

WARNING: MOG is Reducing Air Fleet Throughput by as much as 52.1% At Some Airports. See 'Airlift' and 'MOG' Set Up for Details.

CRAF Cargo Contribution is 0% of Total Airlift Contribution. Consider reducing CRAF participation if MOG problems.

Visa UE Container Deliveries are ~ 11% of Total UE & CS/CSS at Closure.

WARNING: Max Daily Berthing Reqt of 6 exceeds SPOD Berthing Capacity of 4. Scenario exceeds SPOD Capacity on 1 out of 220 Days .

Change LOG

Air Network Status

Total Reqt STONS (Above/Below the Line)

To Region 3 From:	CONUS E	CONUS W	EUCOM	JAPAN	User APOE	Region 1	Region 2	Region 3	Us	
Combat "+	[illegible]	32,000	22,400	-	-	-	-	-		
CS/CSS	116,040	77,360	-	-	-	-	-	-		
Sustainment	53,003	35,335	-	-	-	-	-	-		
Total Reqt	440,877	[illegible]	22,400	-	-	-	-	-		
For MOG Problems Go to Airlift Worksheet to View Details on Maximum Fleet Potential Reduction Due to MOG on Each Route										
MOG Problems: Day 0 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None		
MOG Problems: Day 46 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 150 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%
MOG Problems: Day 151 (Air App = 100%)	ER	ER	APOD	None	None	None	None	None	None	52%

Summary

- “Quick Look” - Intuitive
- Variable Requirement
- Variable Defense Transportation System
- Detail and Global View
- Fast and Flexible